

Explain why division by zero has no answer

NAME	DATE	SCORE / 10
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1 Which answer and reason are right for $9 \div 0$?

- ☐ There is no answer, because no number times 0 is 9. ☐ 0, because $0 \times 9 = 0$.
☐ 9, because dividing by 0 does not change a number.
☐ There is no answer, because $9 \times 0 = 9$.

2 “A number divided by 2 is less than the number.” Is this always, sometimes or never true?

- ☐ Always true ☐ Sometimes true ☐ Never true

3 “A number divided by zero is zero.” Is this always, sometimes or never true? Explain how you know, using 2 and a multiplication.

4 Which answer and reason are right for $0 \div 3$?

- ☐ There is no answer, because you cannot divide 0. ☐ 0, because $0 \times 3 = 0$.
☐ 3, because $0 \div 3$ is the same as $3 \div 0$.
☐ There is no answer, because no number times 3 is 0.

5 “A number divided by zero has an answer.” Is this always, sometimes or never true?

- ☐ Always true ☐ Sometimes true ☐ Never true

6

“Zero divided by a number that is not zero is zero.” Is this always, sometimes or never true? Explain how you know, using 14 and a multiplication.

7

Which answer and reason are right for $11 \div 0$?

- ☐ 11, because dividing by 0 does not change a number. ☐ 0, because $0 \times 11 = 0$.
☐ There is no answer, because $11 \times 0 = 11$.
☐ There is no answer, because no number times 0 is 11.

8

“A number divided by 1 is that same number.” Is this always, sometimes or never true?

- ☐ Always true ☐ Sometimes true ☐ Never true

9

Which answer and reason are right for $3 \div 0$?

- ☐ There is no answer, because no number times 0 is 3.
☐ 3, because dividing by 0 does not change a number.
☐ There is no answer, because $3 \times 0 = 3$. ☐ 0, because $0 \times 3 = 0$.

10

Which answer and reason are right for $4 \div 0$?

- ☐ 4, because dividing by 0 does not change a number.
☐ There is no answer, because no number times 0 is 4.
☐ There is no answer, because $4 \times 0 = 4$. ☐ 0, because $0 \times 4 = 0$.

Explain why division by zero has no answer

1 There is no answer, because no number times 0 is 9.

2 Sometimes true

4 0, because $0 \times 3 = 0$.

5 Never true

7 There is no answer, because no number times 0 is 11.

8 Always true

9 There is no answer, because no number times 0 is 3.

10 There is no answer, because no number times 0 is 4.

3 A written explanation

A model answer: Never true. If $2 \div 0$ were 0, then 0×0 would be 2. But 0 times any number is 0, never 2, so no number works. $2 \div 0$ has no answer at all, so it is not zero.

What counts as right: Counts as right if it makes these points: (1) the answer, never true; (2) if $2 \div 0 = 0$, then 0×0 would have to be 2; (3) 0 times any number is 0, so no number times 0 makes 2, and $2 \div 0$ has no answer. Saying that dividing by zero is not allowed, with no multiplication to show why, does not count.

6 A written explanation

A model answer: Always true. $0 \div 14 = 0$, because $0 \times 14 = 0$. The same is true for any number that is not zero: 0 times that number is 0.

What counts as right: Counts as right if it makes these points: (1) the answer, always true; (2) $0 \div 14 = 0$ because $0 \times 14 = 0$; (3) the same multiplication works for every number that is not zero. Giving only the answer 0, with no multiplication, does not count.